wwPDB X-ray Structure Validation Summary Report (i)

May 17, 2020 – 09:44 am BST

PDB ID	:	1BO1
Title	:	PHOSPHATIDYLINOSITOL PHOSPHATE KINASE TYPE II BETA
Authors	:	Rao, V.D.; Misra, S.; Boronenkov, I.V.; Anderson, R.A.; Hurley, J.H.
Deposited on	:	1998-08-02
Resolution	:	3.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

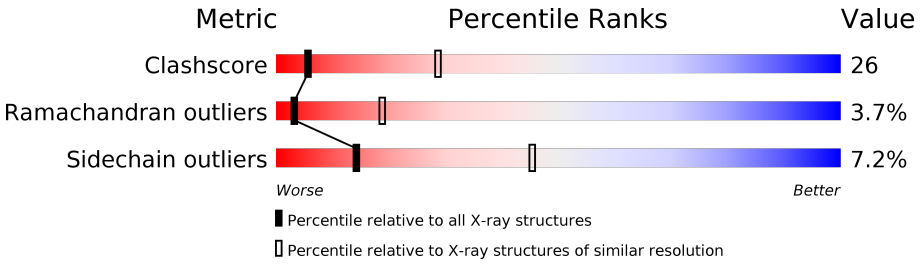
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	416	40% 33% 5% 22%
1	B	416	36% 34% 6% 24%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 5301 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called PROTEIN (PHOSPHATIDYLINOSITOL PHOSPHATE KINASE IIBETA).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	326	Total	C	N	O	S	0	0	0
			2674	1695	454	511	14			
1	B	318	Total	C	N	O	S	0	0	0
			2608	1651	448	494	15			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	13	Total	O	0	0
			13	13		
2	B	6	Total	O	0	0
			6	6		

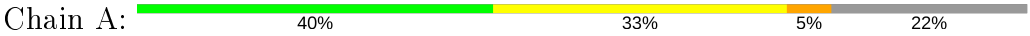
3 Residue-property plots (i)

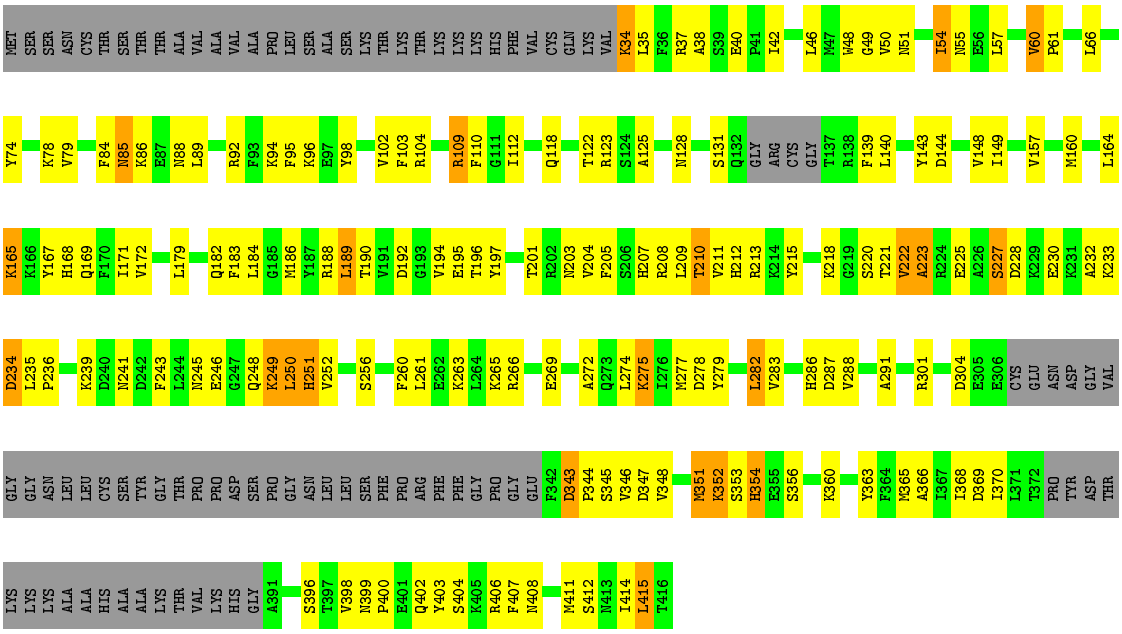
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

- Molecule 1: PROTEIN (PHOSPHATIDYLINOSITOL PHOSPHATE KINASE IIBETA)

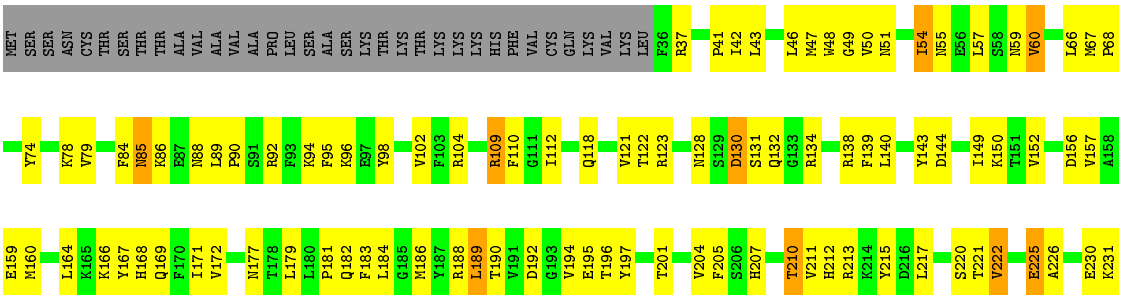
Chain A:

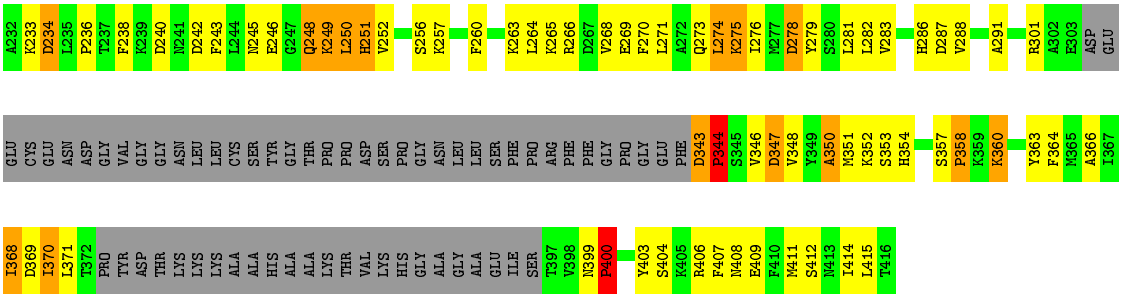




- Molecule 1: PROTEIN (PHOSPHATIDYLINOSITOL PHOSPHATE KINASE IIBETA)

Chain B:




A232 K233 D234 L235 P236 T237 F238 K239 D240 N241 D242 F243 L244 N245 E246 G247 Q248 K249 L250 H251 V252 S256 K257 F260 K263 L264 K265 R266 D267 V268 E269 F270 L271 A272 Q273 L274 K275 I276 M277 D278 Y279 S280 L281 L282 V283 H286 D287 V288 A291 R301 A302 E303 ASP GLU
GLU CYS GLU ASN ASP GLY VAL GLY GLY ASN LEU LEU CYS SER TYR GLY THR PRO PRO ASP SER PRO GLY ASN LEU LEU SER PHE PRO ARG PHE PHE GLY PRO GLY GLU PHE D343 P344 S345 V346 D347 V348 Y349 A350 M351 K352 S353 H354 S357 P358 K359 K360 Y363 F364 M365 A366 I367
I368 D369 I370 L371 T372 PRO TYR ASP THR LYS LYS LYS ALA ALA HIS ALA ALA LYS THR VAL LYS HIS GLY ALA GLY ALA GLU ILE SER T397 V398 N399 P400 Y403 S404 K405 R406 F407 N408 E409 F410 M411 S412 N413 I414 L415 T416

4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	109.92Å 182.40Å 106.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	6.00 – 3.00	Depositor
% Data completeness (in resolution range)	94.9 (6.00-3.00)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
Refinement program	X-PLOR 3.8	Depositor
R, R_{free}	0.229 , 0.299	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5301	wwPDB-VP
Average B, all atoms (Å^2)	48.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.44	0/2726	0.68	1/3668 (0.0%)
1	B	0.43	0/2660	0.70	1/3580 (0.0%)
All	All	0.44	0/5386	0.69	2/7248 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	368	ILE	N-CA-C	6.23	127.81	111.00
1	A	368	ILE	N-CA-C	5.41	125.62	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2674	0	2631	126	0
1	B	2608	0	2572	144	0
2	A	13	0	0	0	0
2	B	6	0	0	1	0
All	All	5301	0	5203	268	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 26.

The worst 5 of 268 close contacts within the same asymmetric unit are listed below, sorted by

their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:212:HIS:HD2	1:B:287:ASP:H	1.20	0.90
1:B:157:VAL:HG21	1:B:197:TYR:CD2	2.07	0.90
1:A:223:ALA:H	1:A:225:GLU:HG2	1.39	0.87
1:A:215:TYR:HB2	1:A:283:VAL:HB	1.60	0.83
1:B:215:TYR:HB2	1:B:283:VAL:HB	1.63	0.80

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	318/416 (76%)	268 (84%)	39 (12%)	11 (4%)	3	20
1	B	312/416 (75%)	266 (85%)	34 (11%)	12 (4%)	3	18
All	All	630/832 (76%)	534 (85%)	73 (12%)	23 (4%)	3	19

5 of 23 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	222	VAL
1	A	232	ALA
1	A	396	SER
1	B	222	VAL
1	B	275	LYS

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	302/374 (81%)	283 (94%)	19 (6%)	18 51
1	B	295/374 (79%)	271 (92%)	24 (8%)	11 40
All	All	597/748 (80%)	554 (93%)	43 (7%)	14 45

5 of 43 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	54	ILE
1	B	134	ARG
1	B	370	ILE
1	B	60	VAL
1	B	85	ASN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 23 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	286	HIS
1	B	51	ASN
1	B	273	GLN
1	A	399	ASN
1	B	55	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.